Advisory Report

Service Broker Update: Key Transformation Component Comes of Age

July 28, 2010

Joe McGarvey
Current Analysis
Principal Analyst,
IP Services
Infrastructure

Issue

Telecommunications networks have been delivering services of some sort in a contiguous fashion for the past 100 years. This record of consistency is especially impressive in light of the fact that operators have essentially built out new networks with every generation of services they have supplied, leaving the typical carrier service delivery infrastructure a collection of vertical networks – IN, NGN and, eventually, IMS – with dedicated sets of services. The major problem this history of continuous and simultaneous growth of mostly-incompatible network and service layers presents to today's operators is that they can no longer maintain the burden of operating multiple networks or reproducing the same service several times to ensure it is available to all subscribers.

Negotiating the labyrinth of protocols and service domains in order to introduce a new service have robbed operators of the agility and efficiency required to compete with Internet counterparts, which have attracted legions of developers to their open, consistent and universally accessible platforms. With the option of starting from scratch with a brand new network out of the question, operators are instead beginning to turn to a sort of bridging technology that is designed to homogenize operator networks by creating a bond of commonality between a carrier's various network and services layers.

These so-called service brokers are becoming the object of M&A activities, as well as RFPs from operators looking to inject their service delivery infrastructures with a shot of Internet-like agility. Though service broker technology has been around for several years, its recent turn in the telecommunications spotlight has generated multiple questions around the new product class in terms of its relationship to service delivery platforms (SDP), differentiation between competing products, and the relative merits of an external service broker in contrast to technology that is built into existing layers of the network.

Continued

Report:

Service Broker Update: Key Transformation Component Comes of Age

IP Services Infrastructure

Current Perspective

Though enough information has been written and presented on the topic of the need for telecommunications operators to transform their networks and business models to compete more effectively in the future communications industry to fill a wing of the Library of Congress, the ever-sprawling archive could be neatly distilled into a single aphorism: To compete with Internet-based service providers, operators must become more like Internet-based service providers. That simple and straightforward assessment of the challenge facing operators strikes at the heart of the recent coming-of-age climb to prominence of service brokers. Service brokers, which have undergone multiple technical makeovers and been subjected to various functional misinterpretations and market confusion over the past few years, are finally taking a turn in the spotlight, as operators are increasingly recognizing the product group's potential for leveling the playing field against over the top (OTT) competitors.

It has long been recognized that a key advantage of Internet-based service providers over telecommunications operators is their agility, which is mostly manifest in their ability to deliver compelling new applications and services quickly that are consumable by essentially any subscriber with a browser-powered fixed or mobile device. Equally well understood is that the source of this agility is largely a result of all Internet-based services conforming to essentially a single language or protocol (HTTP). With some exception, each new Web-based service is instantly compatible with the existing subscriber base and can be intermingled with any pre-existing Internet-based service or resource, such as a billing system.

Telecommunications operators, of course, do not do business in such a homogenized world. Generations of accumulated legacy service delivery equipment and protocols severely limit the fluidity of the typical operator's service delivery process. In the vertical realm of telecommunications carriers, each new service is essentially isolated on its own island. This technology isolation means the service is typically available to a limited number of subscribers, often incompatible with equipment from another vendor and often associated with a dedicated billing and management system.

The result of all this specialization is that operators must work ten times harder than their Internet-based competition to ensure that a new service reaches a large swath of subscribers, that it is compatible with existing services and that it can be provisioned and monetized. And that's just the acrobatics involved within a single access network. For operators looking to offer services that span different access domains – fixed and wireless – the headaches increase tenfold.

While it's an oversimplification to classify service brokers as the magic elixir for all of an operator's agility deficiencies, the technology is designed at the highest level to create a sort of services middleware that provides a bridge of commonality between different protocols, vendor-specific equipment, service domains and access networks. When deployed in conjunction with a service delivery platform (SDP), which significantly accelerates the time-to-market capabilities of an operator, a service broker is instrumental in assisting operators in doing a fairly creditable imitation of an OTT service provider.

Service Brokers at Work

While opening up their networks to derive revenue from monetizing unique assets and to give OTT players a run for their money (i.e., in terms of the breadth and sophistication of services they can deliver to subscriber) is the ultimate goal of operators, those objectives are not yet directly fueling the recent rise of the service broker sector of the market, which has generated a flurry of M&A and RFP activity in recent months. The two trends are obviously related. Telecom equipment makers (e.g., Amdocs, Metaswitch and Oracle) are buying up service broker specialists (e.g., jNetX, AppTrigger and Convergin, respectively) to extend their existing service-layer offerings and to respond to increasing interest from operators of all sizes and access types. The resulting RFPs, rather than quests for instant OTT compatibility, are usually linked to any of several specific service integration goals:

Report:

Service Broker Update: Key Transformation Component Comes of Age

IP Services Infrastructure

• **Extending services to multiple domains:** The last thing operators want to do is maintain multiple versions of the same service or invest resources in launching a service that is applicable to only a small portion of the subscriber universe. Service brokers address these issues by providing signaling interworking between multiple domains, such as between IN and IMS environments. This capability provides operators, for example, with the financial justification to create IMS-based applications, despite the fact that only a small portion of their subscriber bases are equipped with the devices and capabilities that IMS requires.

• **Leveraging domain-specific assets:** A corollary of the scenario above is a desire of operators to extend resources that have been developed for a specific services domain into additional domains. Centralized facilities, such as policy management engines, charging engines and centralized databases can be extended to all types of services and across different access networks using a service broker. A popular use of service brokers, for example, is to increase the service catalog available to pre-paid users by leveraging a service broker to create connectivity between traditional post-paid services, such as VPN, and a pre-paid charging engine.

• **OpEx reduction through asset consolidation:** In the vertically aligned world of telecommunication service delivery, essentially every service is fortified with dedicated resources, such as billing engines. Another popular job description of a service broker is making the service delivery infrastructure horizontally oriented by enabling operators to consolidate the operational resources that provide specific functions to services – making those functions and features reusable by multiple services.

• **Legacy migration and the severing of call control from services:** Operators are challenge by the need to expand aging and often proprietary equipment for delivering IN services. Due to the proprietary ties between switching and services infrastructure, however, operators must continue to maintain and expand these expensive service domains – as well as rely on a single vendor for updates. With a service broker inserted between switching resources and IN services equipment, operators can begin to gracefully retire legacy services equipment by migrating those services to state-of-the-art, industry-standard servers.

• **Service Innovation:** When the boundaries between access networks and services domains are erased, operators gain access to a new palate of service components that can be combined and manipulated to create unique and personalized services. With the ability to combine services from multiple and previously incompatible IN platforms and to blend them with SIP or IMS-based services, operators have access to a range of new product promotions that is limited only by the operator's imagination.

To deliver the any-to-any connectivity between networks and service domains the above usage scenarios require, most service brokers offer a set of capabilities that are for the most part consistent across the various vendor implementations. All share a Rosetta stone quality, offering the ability to converse in a variety of call control and signaling languages, including SS7, ISUP, SIP, CAMEL, WIN, INAP and TCAP, and to provide interworking capabilities between and across network and service layers of the service delivery infrastructure.

At the network layer, most service brokers provide network abstraction capabilities, which supply both a gateway into underlying network functions and interworking across different access networks, such as all forms of wireless and fixed networks. Network abstraction is a core function of most SDPs and a crucial element of operator efforts to open up their networks to third parties. In addition to signaling interworking, most service brokers also supply 3GPP-specificed functionality, such as the IMS-based services capability interaction manager (SCIM) and the IM-SSF and Reverse IM-SSF functions. The IM-SSF is designed to enable IN-based applications to be applicable to IMS environments and the aptly named Reverse IM-SSF enables IMS-based services to be relevant to subscribers attached to IN-based infrastructures. The SCIM function, which has only recently been given more

than cursory treatment by the 3GPP, essentially oversees the coordination of blending services across multiple IMS application servers. Tekelec points to the SCIM function in IMS to describe its service broker's role in SS7 and pre-IMS, or NGN, networks. IN to IN trigger management is the IN-based service broker function that is most akin to SCIM functionality in an IMS domain.

Stringing together multiple IN services in traditional environments has always been a near-impossible feat. A service broker significantly simplifies the task by acting as a liaison between the network (switching equipment) and the IN services domain (SCP). In a mobile environment, a service request from an MSC would be directed to the service broker, which in turn would pass on the request to one or multiple SCPs, before returning a response to the MSC.

All service brokers, however, are not created equally. Variations exist, for example, at the signaling interworking level. Some service brokers do not support as many interworking scenarios as others, or at least to the same degree as others. In addition, some service brokers provide gateway services that enable third-parties to tap into exposed APIs. Most products, however, work with an SDP to provide third-party gateway functions that expose assets in their native form, as Web services APIs or parlay X APIs. At least two service brokers – products from Opencloud and Amdocs – provide a service creation and execution environment intended for next-generation IN services. And one service broker, the former AppTrigger product acquired by Metaswitch, offers media handling capabilities. For a comprehensive comparison of service broker competitors, see table on the next page.

Service Broker Competitor Comparison

	Aepona Service Broker	Amdocs jNetX Service Broker	Metaswitch Service Broker	Opencloud Rhino SIS	Oracle Communications Service Broker	Tekelec EAGLE XG Service Broker
Signaling Interworking (any to any)	CAP to INAP, INAP to CAP, INAP-INAP variants, SIP to INAP/CAP	CAP (v1 to v4), INAP (CS1, CS2 + vendor specific CS1 versions), WIN (1,2,3), AIN and SIP (both 3GPP ISC and IETF)	Interworking between all versions of SIP, Camel, WIN, TCAP, AIN/INAP	ETSI INAP CS1, CAP1, CAP2, CAP3, SIP, Ericsson INAP CS1, Ericsson INAP CS1+, SINAP 5m+, SINAP 7m+, Nokia INAP and customer requested options	Interworking between all versions of INAP, CAP, WIN and SIP	Tekelec claims Service Broker mediates between SS7, NGN and IMS environments
Support for Diameter	Planned for future	Supports Diameter to Radius gateway function and any customization	Yes	Supports both RADIUS and Diameter but interworking of RADIUS and Diameter must be implemented	Supports DIAMETER Ro interface	Vendor did not provide information
GUI Interface	Yes	Icon-based GUI or a scripting language-based interface is supported	Yes	Full drag and drop GUI for specifying, defining, provisioning, adapting, supporting and maintaining “service compositions”	Yes	Vendor did not provide information
Latency	Sub 10 ms (INAP/CAP and SIGTRAN)	10 to 20ms in live deployments	Carrier-Class with 25 ms latency	Dependent on platform and implementation scenarios. Typical performance overhead is ~<18ms	Vendor did not provide information	Vendor did not provide information
BHCA	Approximately 10 million	5.4 Million BHCA	Available and deployed in N+1 configurations. Typical per node performance 1M BHCA, supporting multiple node deployment environments	A two-server cluster (each server being a 4-CPU core Intel machine) delivers nearly 9 million BHCA	Vendor did not provide information	Vendor did not provide information
Service Exposure (parlay x or REST APIs)	No	Provides service exposure internally	APIs including Parlay/X, Web Services, C++ and XML Scripting for signaling interworking configuration	Provides SOA exposures of some network enablers such as third-party call, messaging and charging.	Works with Oracle Communications Services Gatekeeper for service exposure	No
Hardware platform	Sun M3000, Solaris 10	Based on Java and runs on off-the-shelf hardware from SUN, IBM and HP	Open standard Intel-based COTS hardware	x86-based servers from Sun, HP and IBM. Runs on Java on Solaris and Linux.	Oracle’s Sun Netra CT900 ATCA blade server and x86/Linux	ATCA-based blade platform
Media handling	No	Only when the bearer traffic is included in signaling protocol	Yes - Integrated or through remote media gateway mgmt.	No	No	No
Key Customers	Orange UK, Orange France, KPN, Centertel, Orange Poland, Orange Spain, Optimus	Axtel (2008), STC (2009), Mobily (2009), Globe Telecommunications (2009)	O2, Vodafone D2, MovilNet, British Telecom, Telefonica, Chunghwa Telecom, AIS	Vodafone Spain (2007), Vodafone Portugal (2010), Vodafone Italy (2010), Smart (2009)	Recent customers include large European operator and other non-disclosed deployments	Vendor did not provide

Report:

Service Broker Update: Key Transformation Component Comes of Age

IP Services Infrastructure

Given the wide-ranging capabilities of service brokers and their history of market and function confusion, it's helpful to position the product class based on a service broker's relationship to other topical carrier-oriented technologies and architectures, such as SDP, IMS and policy control and SDM.

• **SDP:** Though the definition of a service delivery environment may be as malleable as that of a service broker, the relationship between the two are mostly complementary and slightly overlapping. As mentioned above, a service broker provides the network abstraction capabilities that are necessary for an SDP to provide services that are consumable across different access networks or serviced by different session control systems. The service broker's protocol mediation and network abstraction capabilities are also essential in exposing underlying network resources to third parties. Also as discussed above, some service brokers are also equipped with functionality to provide third-parties with access to those resources and manage the relationship between operator and partner, though that functionality is more often the job description of the SDP. As a rule of thumb, an SDP is often service-domain specific (e.g., IN only). It is when an SDP is paired with a service broker that the capabilities of an SDP are extrapolated to all access networks and service domains.

• **IMS:** Service brokers relate to the IMS architecture on several levels. By one measurement, the two are independent, with IMS representing just one of several switching and application domains – others being IN and NGN -- that are bridged by a service broker. Most service brokers, however, also provide orchestration and interworking capabilities, such as the SCIM, IM-SSF and Reverse IM-SSF that are defined by the 3GPP standards body and are part of the IMS specification. The service broker's simultaneous independence from and integration with IMS has contributed to market confusion around the definition of the product over the past few years.

• **Policy control and SDM:** With the recent pairing of Camiant and Blueslice through acquisitions by Tekelec, much as been made of the synergies between policy management and SDM, as well as the impact the pairing will have on operators' ability to improve customer experience and drive new revenue. Through a service broker, operators have the potential to extend the functionality and capabilities of policy management and SDM solutions to all segments of the network, including legacy services that had previously been incompatible with the mostly IP-based policy and SDM resources.

Short Shelf Life?

Another perception issue that helped to dampen early enthusiasm around the service broker market was the belief in some circles that the product category's primary functions – bridging together service environments – would be made obsolete as operators adopted IMS and moved service delivery to all-IP environments. A bridge between IN and IMS domains would serve a limited purpose when all services and service delivery infrastructures are based on IMS, went the reasoning of service broker skeptics.

As it became obvious in recent years that IMS would not be adopted en masse and operators would maintain multiple switching and service domains for several more years, the perceptual stock of service broker companies began to rise, culminating in a trio of acquisitions over the last part of 2009 and H1 2010. Though all three acquisitions were initiated for different reasons and each acquired company offered different assets, the common denominator across Amdocs, Metaswitch and Oracle's service broker purchases was the desire to extend their addressable market. For Amdocs, the jNetX platform was exactly what the company needed to extend its well-regarded charging and billing systems to multiple service environments. Metaswitch purchased AppTrigger largely to extend the company's mostly fixed-oriented software offerings to mobile operators. Finally, Oracle's purchase of Convergin was a no-brainer, as the Convergin service broker brings required capabilities to Oracle's overall SDP and it has been deeply integrated into the BEA Systems properties that Oracle acquired a couple of years ago.

The service broker story is not yet complete, however, and the ending could still turn out to be

something short of happily-ever-after for the product category. Two major obstacles still remain. The first is the fact that even if the shelf life of a service broker is longer than at first believed, the product will eventually run out of relevance. Though it will take years, even beyond a decade, for operators to move to a pure IP environment, legacy switching and legacy service environments will eventually fade away, leaving little for service brokers to do outside of IMS-based service orchestration.

The second obstacle comes in the form of resistance to standalone service brokering agents by most of the dominant network equipment makers in the world. Alcatel-Lucent, Ericsson, Huawei and even Nokia Siemens Networks (NSN) have not publicly endorsed a standalone service broker, instead suggesting that the functionality should be distributed across the various network layers, i.e., application and control. Critics suggest that the opposition to external service brokers from network equipment providers relates to the fact that placing an external agent between service domains and switching infrastructure creates an unwelcome separation between two entities that equipment providers prefer to remain linked, ideally through proprietary means. Though the veracity of those claims have not been publicly validated, the reluctance of major equipment makers to endorse a standalone approach to service brokering, at least to this point, hurts the still-burgeoning market because of the sway large equipment suppliers have with operators and, moreover, because the obvious suitors for future M&A activity have no apparent interest in scooping up the remaining independent service broker providers.

From an outsider's perspective, the apparent disinterest in standalone service brokers by major network equipment providers is a welcome event. If operators eventually figure out that service brokers are a key element in their efforts to stave off competitive threats for OTT players, owners of standalone products, such as Aepona, Amdocs, Metaswitch, Oracle and Tekelec, may be sitting in the perfect position to increase their penetration into large operators – mostly at the expense of traditional suppliers.

Recommended Actions

Recommended Vendor Actions

• Makers of service brokers need to promote their products as being integral components of an overall service delivery solution and complementary to an SDP. Service broker vendors should make it clear that their products provide the network abstraction and protocol mediation capabilities that are part of the baseline attributes of an SDP. Accordingly, service broker manufacturers need to make clear that no adversarial relationship exists with SDP suppliers and that the two solutions are complementary rather than competitive.

• Service broker makers need to emphasize the technology and vendor-neutral qualities of their products. Participating vendors should make clear that a standalone entity that is external to both the application and control layers of an IMS-based service delivery environment is by nature vendor agnostic, creating a break in the proprietary link between switching and services.

• All service broker makers, especially members of the Service Broker Forum, need to differentiate their products. While the launch of the forum was successful in raising the public profiles of its participants, it also created the perception that all service brokers are generally similar in terms of feature set and functional composition. Outside of forum activity, service broker makers need to be aggressive in pointing out superior qualities of their own solutions.

• Service broker makers should consider expanding the functionality of their products to include support for the diameter signaling protocol. With fixed and especially mobile operators adopting subscriber data management and policy management capabilities to improve the customer experience, diameter will become an increasingly common component of IMS-based network deployments. The ability to support diameter-to-Radius interworking, for example, could become a strong competitive

Report:

Service Broker Update: Key Transformation Component Comes of Age

IP Services Infrastructure

differentiator.

• Makers of service brokers that include third-party gateways that expose APIs to operator partners and manage those relationships should consider offloading that functionality to an SDP. Most SDPs already offer these capabilities and service broker makers can reduce overlap with an SDP by removing or downplaying the third-party gateway capabilities of their platforms.

• Network equipment makers, such as Alcatel-Lucent, Ericsson, Huawei, NSN and ZTE, need to defend decisions to locate service interaction and interworking capabilities in existing layers of the network, as oppose to creating a service broker that resides between the application and control layer of the network. These competitors need to invalidate claims that they are opponents of standalone service brokers because a standalone approach by nature severs any proprietary links between the underlying network and the application layer of the network.

• Providers often enter the region in support of existing multinational clients that are building out operations in the region. Carriers and IT solution providers should look at the potential to extend their presence in Latin America first through relationships with established regional carriers such as America Movil/Telmex or Oi in Brazil that will allow them to not only expand more quickly but also reduce their risk, and then potentially through acquisitions.

• System integrators with specific expertise in regionally relevant vertical industries such as manufacturing and oil and gas should look at extending existing carrier alliances with both Latin American incumbents and international providers to create repeatable consulting-led solutions. In particular, IT solution providers need to focus on developing dynamic offers that take into account customers' changing capacity requirements.

Recommended User Actions

• Operators need to understand the role that service brokers will play in homogenizing their networks to a point where the operator can introduce a new service that is compatible with existing service and consumable by nearly 100% of the operator's subscriber universe. Operators must recognize that the deployment of a service broker in conjunction with an SDP is the key to increasing the service introduction agility of mobile and fixed operators.

• Operators need to recognize that service brokers are a key source of technology for enabling the evolution of their networks to all IP. Carriers should deploy service brokers as a means of protecting previous investments but with an eye toward replacing those legacy investments with IP-based equipment. Operators should not deploy service brokers in a manner that would allow them to freeze the transformation of their networks.

• Operators need to consider the merits and attributes of a standalone service broker in comparison to an approach that distributes protocol mediation and service orchestration to multiple layers of the network. Operators should challenge proponents of the respective approaches to vigorously defend their positions and provide evidence supporting their point of view.

• The efficacy of a service broker should be a measurement of the platform's ability to assist operators in moving existing services off of proprietary hardware platforms. Operators also need to press service broker makers for information and proof points about their success rates in assisting operators in the dismantling of legacy services infrastructures.

• Operators need to continue to tightly link service broker capabilities to IT and SOA systems and processes. Through integration at this level, operators can extend existing IT-base processes to all of the services they offer across their networks, further creating synergies between the IT and network sides of the business.